Impact of green marketing, greenwashing and green confusion on green brand equity

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Abstract

Purpose – This study aims to examine the negative effects of excessive product packaging (EPP), greenwashing and green confusion on green brand equity (GBE). Furthermore, the moderating role of brand credibility in mitigating the negative effects of green marketing was investigated.

Design/methodology/approach – A within-subject experiment was conducted to evaluate excessive versus minimal product packaging to test the proposed hypotheses. Data analysis was performed with SmartPLS 3.3.3, which analyzed data from 206 consumers.

Findings – The results showed that EPP positively predicts greenwashing and green confusion. However, greenwashing has a negative impact on GBE. Brand credibility was also discovered to moderate the negative relationship between greenwashing and GBE, thereby reducing the negative effect of greenwashing.

Research limitations/implications – The findings imply that marketing managers should understand the consumers' concerns for the environment, making product and brand strategies that promote environmental protection and sustainability.

Originality/value – This study contributes to the green marketing literature by empirically validating the positive impacts of EPP on greenwashing and green confusion, as well as the negative influence of greenwashing on GBE. Furthermore, it reveals how brand credibility can reduce the harmful effects of greenwashing on GBE.

Keywords Brand credibility, Brand equity, Green marketing, Greenwashing, Excessive product packaging, Green confusion

Paper type Research paper

Impacto del marketing verde, el greenwashing y la confusión verde en el valor de la marca verde

Resumen

Objetivo – Examinamos los efectos negativos del embalaje excesivo de los productos, el "greenwashing" y la confusión verde sobre el valor de la marca verde. Además, se investigó el papel moderador de la credibilidad de la marca para mitigar los efectos negativos del marketing ecológico.

Diseño – Se llevó a cabo un experimento intra-sujeto para evaluar el embalaje excesivo de los productos frente al mínimo envase posible, con el fin de comprobar las hipótesis propuestas. El análisis de los datos se realizó con SmartPLS 3.3.3, con una muestra de 206 consumidores.

Conclusiones – Los resultados mostraron que el embalaje excesivo de los productos predice positivamente el greenwashing y la confusión ecológica. Sin embargo, el greenwashing tiene un impacto negativo en el valor de la marca verde. También se descubrió que la credibilidad de la marca modera la relación negativa entre el greenwashing y el valor de la marca verde, reduciendo así el efecto negativo del greenwashing.

Implicaciones – Las conclusiones implican que los directores de marketing deben comprender las preocupaciones de los consumidores por el medio ambiente, elaborando estrategias de producto y de marca que promuevan la protección del medio ambiente y la sostenibilidad.

Originalidad/valor – Este estudio contribuye a la bibliografía sobre el marketing ecológico al validar empíricamente los efectos positivos del embalaje excesivo de los productos sobre el greenwashing y la confusión ecológica, así como la influencia negativa del greenwashing sobre el valor de la marca ecológica. Además, revela cómo la credibilidad de la marca puede reducir los efectos perjudiciales del greenwashing sobre el valor de la marca verde.

Palabras clave – Marketing verde, Greenwashing, Confusión verde, Valor de marca, Credibilidad de marca y embalaje excesivo de productos

Tipo de artículo – Trabajo de investigación

绿色营销、洗绿和绿色混淆对绿色品牌资产的影响

摘要

目的 – 我们研究了产品过度包装、洗绿和绿色混淆对绿色品牌资产的负面影响。此外，我们还研究了品牌信誉在减轻绿色营销负面影响中的调节作用。

实验设计 – 我们进行了一项受试者内实验，以评估产品过度包装和最小包装，从而检验所提出的假设。用SmartPLS 3.3.3进行数据分析，该软件分析了206来自各消费者的数据。

研究结果 – 结果显示，过度的产品包装正向预测了洗绿和绿色混淆。然而，洗绿对绿色品牌资产有负面的影响。品牌信誉也被发现可以调节洗绿和绿色品牌资产之间的负面关系，从而减少洗绿的负面影响。

影响 – 研究结果表明，营销经理应该了解消费者对环境的关注，制定促进环境保护和可持续发展的的产品和品牌战略。

原创性/价值 – 本研究通过实证验证产品过度包装对洗绿和绿色混淆的积极影响，以及洗绿对绿色品牌资产的负面影响，为绿色营销文献做出了贡献。此外，它还揭示了品牌信誉如何减少洗绿对绿色品牌资产的有害影响。

关键词 – 绿色营销, 洗绿, 绿色混淆, 品牌资产, 品牌信誉, 以及产品过度包装

文章类型： 研究型论文

1. Introduction

There is an increasing awareness of the environmental commitment of corporations because these commitments enhance competitive advantage (Chen and Chang, 2013a). Customers in developed economies initially valued environmentally sustainable products more (Bekk *et al.*, 2016). Nowadays, most of the information is available on the internet (Flavián *et al.*, 2009); consequently, consumers in developing economies are increasingly becoming aware of the environmental performance of corporations (Khandelwal *et al.*, 2019). The World Air Quality Index (IQAir, 2021) results have shown that consumers in Pakistan have shown a keen interest in eco-friendly corporations (Soomro *et al.*, 2020; Hameed *et al.*, 2021a).

As consumers become more aware of environmental issues and demand environmentally friendly products, companies must adjust their brand equity management to take advantage of green brand equity (GBE) (Khandelwal *et al.*, 2019). Thus, GBE is a recent trend gaining attention among researchers and practitioners. In addition, researchers have found that GBE can positively affect consumers in many other ways, such as positive word of mouth (Bekk *et al.*, 2016), brand attitude (Khandelwal *et al.*, 2019; Bekk *et al.*, 2016) and intention to buy (Górska-Warsewicz *et al.*, 2021).

The importance of GBE was recognized in several studies conducted to examine the green practices that encourage it. Existing research, for example, identified green trust, green satisfaction, green attitude, green loyalty, green brand image and green brand perceived value as green practices that foster GBE (Chen, 2010; Kang and Hur, 2012; Bekk *et al.*, 2016; Ng *et al.*, 2014; Górska-Warsewicz *et al.*, 2021). However, certain green marketing practices that may have a negative impact on GBE were ignored entirely in the available body of knowledge. Take the analogy of the profit model, where profit is a function of increasing sales (fostering positive actions) and reducing costs (avoiding negative actions) (Rust *et al.*, 2002). Similarly, GBE is strengthened either by promoting positive green marketing practices or avoiding negative ones. Given that the majority of existing knowledge has focused on the green practices that enhance GBE, the literature is chiefly mute on the green marketing practices deteriorating GBE.

Therefore, this study adds to the existing knowledge by investigating green marketing practices that negatively affect GBE. We aim to demonstrate that excessive product packaging (EPP) negatively impacts GBE, intervened by greenwashing and green confusion. Although a company labels itself as a green seller, we argue that EPP escalates greenwashing and green confusion, resulting in reduced GBE. We further draw on the consumer trust literature to propose and empirically validate that brand credibility (as a moderator) mitigates the adverse effects of green practices on GBE.

Our study fills several gaps in the green marketing literature. First, in response to increased attention to environmental problems (Chen *et al.*, 2018), many firms began to focus on product packaging. Moreover, consumers tend to feel guilty and responsible for discarding the waste of excessively packaged products (Chen *et al.*, 2017; Kautish *et al.*, 2021). Arguably, many sellers began to market themselves as green sellers (Khandelwal *et al.*, 2019). Meanwhile, in the highly competitive marketplaces, sellers adopt multiple strategies (such as quality, value-added services, packaging) to enhance the brand image (Hameed *et al.*, 2021a). As a result, sellers often do EPP in their quest for a better brand image (Chen *et al.*, 2017). Under these circumstances, consumers may perceive the seller culprit of greenwashing. Akturan (2018) referred to greenwashing as a seller's insincere and misleading environmental claims. Consumers may become suspicious when a seller, on the one hand, makes green claims while, on the other hand, indulges in EPP. As Hameed *et al.* (2021a) argued, when sellers hide facts and promote only positive aspects of their green performance, consumers suspect their actions as greenwashing. Hence, we assume that EPP is one factor that fuels consumer perceptions of greenwashing, lacking empirical evidence in the available body of knowledge.

Second, since many sellers make exaggerated green claims (Yang *et al.*, 2021), consumers invariably become skeptical of the company's green claims (Silva *et al.*, 2020; Waris and Hameed, 2020) when confronted with EPP. This ambiguity drives consumers to question whether a seller practices green marketing in true spirit (Yang *et al.*, 2021). We can argue that EPP creates doubt in the minds of consumers if a seller is a trustworthy green company. From the synthesis of existing literature, we did not find any evidence which empirically investigated the relationship between EPP and green confusion.

Third, we propose greenwashing and green confusion as predictors of GBE. Previously, greenwashing has been investigated to predict green skepticism and negative word of mouth (Leonidou and Skarmeas, 2017), brand credibility (Akturan, 2018), green trust (Chen and Chang, 2013b) and brand image, brand love, brand loyalty and purchase behavior (Hameed *et al.*, 2021a). Similarly, consumer confusion was examined to predict green consumption intentions (Yang *et al.*, 2021) and consumer trust (Chen and Chang, 2013b). However, there is a lack of evidence that existing studies directly validated the harmful effects of greenwashing and green confusion on GBE. Akturan (2018) suggests that the impact of negative green marketing practices on the green brand has mostly escaped the researcher's attention, warranting more investigation. From the managerial perspective, marketers should inform the long-term consequences of greenwashing and green confusion on their brands. As the proposed relationships have theoretical and managerial significance, the present study aims to investigate them empirically.

Finally, literature reviews on greenwashing and green confusion reveal that most existing research was conducted using a survey approach (Yang *et al.*, 2021). However, there are limitations to the reliability of surveys for ensuring the internal validity of constructs (Jamil and Qayyum, 2021) and inherent standard method variance (Podsakoff *et al.*, 2003). Recently, Kautish *et al.* (2021) made a call for experimental designs while investigating consumer environmental concerns. As a result, we used an experimental design to investigate how greenwashing and green confusion impact GBE. We also compared effects between excessively packaged vs minimally packaged products, which add to the uniqueness of this study.

2. Literature review and conceptual framework
These days, more information is available online (Barta *et al.*, 2021), enabling consumers from developing countries to become aware of green marketing (Kautish, 2018). All the marketing initiatives, including communications of environmentally friendly products (e.g. advertising, publicity and public relations), production and distribution of green products, eco-labeling and branding, are collectively referred to as green marketing practices (Groening *et al.*, 2018; Nguyen et al., 2019). Green marketing practices promote a green self-image and favorable consumer responses (Chung, 2020). Recent research, for example, identified green trust, green satisfaction, eco-innovation, green attitude, green loyalty, green brand image and green brand perceived value as green practices that foster GBE and consumer intentions (Górska-Warsewicz *et al.*, 2021; Sharma *et al.*, 2022; Soomro *et al.*, 2020; Waris and Hameed, 2020). In contrast, some green marketing practices, such as greenwashing (Hameed *et al.*, 2021a) and green confusion (Yang *et al.*, 2021), have detrimental consequences.

Previous research classified packaging into three categories: primary, secondary and excessive (Elgaaïed-Gambier, 2016). Researchers and practitioners have recently become interested in excessive packaging, but there is no formal definition. Excessive packaging, which serves more than just protecting the product (Chen *et al.*, 2017), wastes resources and contributes to littering problems that can be hazardous and expensive to clear (Wever *et al.*, 2010). Manufacturers waste resources on the packaging that could be used to save the company and consumers money (Georgakoudis and Tipi, 2020). Elgaaïed-Gambier (2016) asserts that reduced or moderate packaging does not imply low quality. Unfortunately, excessive packaging has become the norm today, to the extent that three layers of packaging need to be uncovered to reveal one piece of chocolate (Song *et al.*, 2015). Despite this practice, consumers believe that EPP is harmful to the environment and call for eco-innovative and sustainable packaging (Sharma *et al.*, 2022; Kautish *et al.*, 2021).

On the flip side, managers hesitate to advertise their environment-friendly initiatives because many of these actions are criticized as "greenwash" (Akturan, 2018). Greenwash is misleading consumers about a company's environmental practices or the environmental benefits of its products and services (Chen and Chang, 2013b; Hameed *et al.*, 2021a). As the use of terms like "green," "environmentally friendly," "sustainable" and "earth-friendly" in advertisements has become more common, the concept of greenwash has gained more attention. Consumers frequently find green statements about environmental qualities ambiguous and unreliable (Akturan, 2018; Kautish *et al.*, 2020), so one could argue that excessive packaging by green organizations could contribute to perceptions of greenwash. Put differently, when on the one hand, sellers practice EPP (which consumers believe is environmentally harmful (Hameed *et al.*, 2021b)), while on the other hand, claim to be green sellers, consumers may become cynical (Waris and Hameed, 2020). This consumer cynicism could be attributed to greenwash. Based on the above argument, it is proposed that consumers would suspect greenwashing when sellers offer excessively packaged products:

H1. Excessive product packaging (EPP) has a significant positive impact on greenwashing.

Consumer confusion results from consumers' inability to accurately assess product attributes during the information absorption process, resulting in misinterpretation of markets and products (Yang *et al.*, 2021). The mode and presentation of information are vital, as it influences how consumers perceive information (Flavián *et al.*, 2009; Flavián *et al.*, 2017). Currently, there is increased attention to green and sustainable products (Spielmann, 2020), which contributes to sellers' desire for competitive advantage through green marketing. The abundance of green marketing has made the consumers prone to green confusion. Consumers may get confused due to the physical similarity of products, information overload or consumers' failure to understand the information they receive (Yang *et al.*, 2021; Mitchell *et al.*, 2005; Loken *et al.*, 1986).

Consumers do not trust advertising that claims a product's goodness, particularly environmental friendliness, when the information provided is ambiguous and unclear (Aji and Sutikno, 2015). Consumers are confused about green products because of this distrust. Green claims need to be accurate, honest and transparent to avoid consumer confusion and skepticism (Chen and Chang, 2013a). Therefore, consumers may get confused when sellers make green claims while practicing EPP. In other words, consumers might wonder if the green claims are credible when it uses EPP, leading to consumer confusion:

H2. EPP has a significant positive impact on green confusion.

Greenwashing impedes green marketing strategies by undermining environmental efforts and making consumers skeptical of sustainability projects (Chen and Chang, 2013b; Silva *et al.*, 2020). Greenwash also prevents consumers from purchasing decisions regarding environmental impacts (Horiuchi *et al.*, 2009). When firms exaggerate or fake the environmental functionality of their products, buyers lose trust in them (Kalafatis *et al.*, 1999).

GBE is a collection of brand assets and liabilities related to green commitments and environmental concerns associated with a brand, its name and its symbol that add to or detract from the value provided by a product or service (Chen, 2010). According to Chen, if customers trust a company's green practices, the GBE will grow. However, it can also be argued that a lack of green trust will stifle the growth of GBEs. Hence, greenwashing may negatively affect GBE:

H3. Greenwashing has a significant negative impact on GBE.

Like greenwash, green confusion is another factor that negatively affects consumer trust in green practices (Chen and Chang, 2013b). When consumers perceive the information offered by the seller to be confusing, their trust in the seller is undermined (Mitchell *et al.*, 2005). Furthermore, customers are hesitant to trust the new products of some companies because they are marketed with misleading and confusing green claims (Kalafatis *et al.*, 1999). Thus, the more green claims a person encounters, the less likely they will trust green products in the marketplace (Chen, 2010), which implies that green confusion will negatively impact GBE.

The literature on consumer confusion and green consumption has yielded conflicting results. For example, Yang *et al.* (2021) found that consumer confusion positively correlates with consumption. However, these findings support Foxman *et al.* (1992) contention that confusion increases rather than decreases consumption. As a result, more research is warranted to understand consumer confusion and green consumption better:

H4. Green confusion has a significant negative impact on GBE.

Brand credibility measures an organization's ability and willingness to consistently maintain performance-enhancing credentials by assessing expertise and trustworthiness (credibility) (Erdem and Swait, 2004). Brand credibility comprises two dimensions: expertise and trustworthiness. Expertise refers to the ability to deliver promises, while trustworthiness refers to the willingness to deliver promises (Akturan, 2018). It is difficult to build brand credibility about green practices because consumers are typically skeptical of green marketing claims (Mendleson and Polonsky, 1995; Silva *et al.*, 2020). However, the literature affirms that brand credibility is vital if a firm wants to develop its green image (Erdem and Swait, 2004). Furthermore, there is evidence that brand credibility positively influences green brand image (Ng *et al.*, 2014) and creates substantial GBE (Akturan, 2018; Adnan *et al.*, 2019).

The extant literature provides sufficient evidence for the positive association between brand credibility and GBE (Akturan, 2018; Adnan *et al.*, 2019; Ng *et al.*, 2014). Therefore, the role of brand credibility is significant when consumers are skeptical and uncertain of the seller's green marketing (Ng *et al.*, 2014). The brand credibility helps consumers determine the truthfulness of green claims (Adnan *et al.*, 2019). Alternatively, green sellers face three significant challenges: uncertainty, green skepticism and low trust (Mendleson and Polonsky, 1995). Hence, when credible brands market green products, consumers are less skeptical and uncertain of those claims (Ng *et al.*, 2014). Thus, we can argue that brand credibility can help overcome the adverse effects on GBE when there is a perception of greenwash and confusion:

H5. Brand credibility moderates the negative effects of (*H5a*) greenwashing; (*H5b*) green confusion on GBE such that the effect of greenwashing and green confusion is reduced when brand credibility is high.

Earlier, we argued that greenwash and green confusion negatively affect GBE. We further contended that consumers dislike excessively packaged products due to waste disposal and environmental concerns (Kautish *et al.*, 2021). In addition, consumers attribute excessive packaging as a waste of resources (Georgakoudis and Tipi, 2020) and the root cause of excessive waste (Singh *et al.*, 2020). The recent attention toward sustainability is so strong that consumers from developing countries have begun showing interest in recycling and waste disposal (Hameed *et al.*, 2021b). Alternatively, consumers prefer product packaging which is sustainable and environment friendly (Wever *et al.*, 2010; Chen *et al.*, 2017). In

support, Elgaaïed-Gambier (2016) added that reduced packaging does not signal a low-quality product. Instead, sellers should look for eco-innovative and sustainable packaging solutions (Kautish *et al.*, 2021; Sharma *et al.*, 2022; Ingaldi and Czajkowska, 2019). In line with the above arguments, we propose that in the presence of EPP, the adverse effects of greenwashing and green confusion on GBE are more pronounced. Hence, we propose that the following hypothesis:

H6. Compared to minimal product packaging, the negative impact of (*H6a*) greenwashing; (*H6b*) green confusion on GBE will be higher when there is EPP.

Based on the proposed hypotheses, the conceptual framework for the current study is generated (Figure 1). First, it shows how EPP contributes to greenwashing and green confusion. As a result, both affect GBE. It is also shown that brand credibility moderates the relationship between greenwashing, green confusion and GBE.

3. Methods
3.1 Focus group interview
We conducted a focus group interview (FG) with 33 university students (*n* = 33) to identify the product for the experimental stimuli. An FG is a recommended technique for gaining valuable early insights into consumer opinions and behaviors (Viertola, 2018). Previously, experimental studies have employed university students (Akturan, 2018) as they are aware of green products (Soomro *et al.*, 2020) and can make better recommendations. The experimental study conducted by Jamil and Qayyum (2021) used FG to select stimuli for participants who were not the primary members of the study. Our current study used a similar method to gain insight into consumer behavior and the selection of experimental stimuli. As a result, the FG members contributed initially to validate the proposed model, which the main experiment participants then validated. The FG members were excluded from the main experiment.

When inquired FG members about the product they believed could be sold/shipped safely using minimal packaging footprints? Most respondents believed apparel could be sold/shipped with minimum packaging (mode = 22). According to the members, since
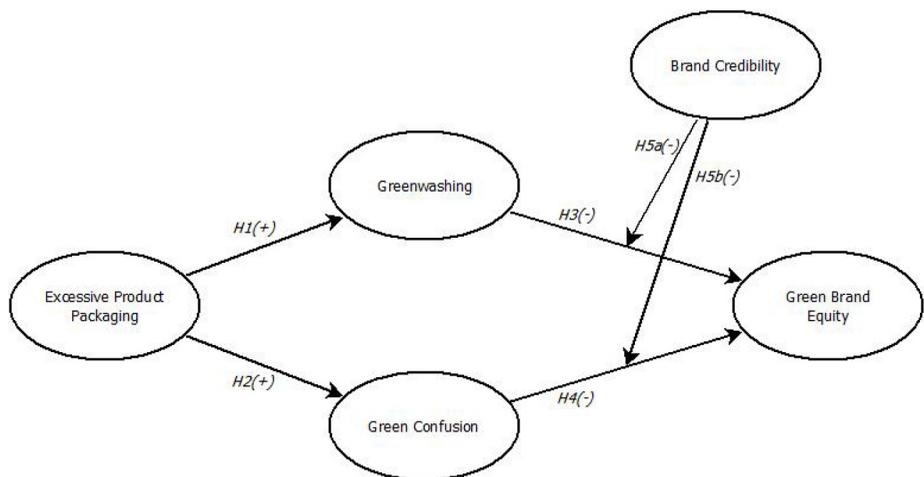

Figure 1.
Conceptual
framework

apparel is not prone to damage like electronics and other fragile merchandise, they can be packaged with minimum paper (or similar material). Based on these recommendations, apparel was selected as an experimental stimulus within the current study. Next, FG was inquired about the type of content (print, audio, photo, or video) for experimental manipulation. Their view is that video is the richest source of information, which can be used for manipulation (mode = 27). Hence, a video was chosen for experimental manipulation, leading to the final question for FG. They were asked what average length of the video should be used for manipulation? Most of them agreed (mode = 22) that the video length should range between 90 s and 4 min. In this way, the subjects would be exposed to stimuli for sufficient time without getting bored or distracted. In addition to within-subject stimuli, two YouTube videos were selected for between-subject stimuli. The first video showed a product being packaged with minimal material, while the second showed excessive packaging used to pack a product.

3.2 Population and procedure

This study employed an experimental design residing upon packaging type (minimal vs excessive) as a between-subjects factor. The apparel was chosen as a within-subjects factor based on the recommendation of the focus group. Internet-using consumers participated in this study, and instead of a lab experiment, an internet experiment was conducted. A social media campaign, email and word-of-mouth tactics were used to inform and attract participants to the study. The participants who volunteered for the study followed the link to the survey page. Each participant was randomly assigned to one of the scenarios. Of the 206 participants, 112 were randomly assigned to the experimental group, while the rest (94) were to the control group.

We asked the participants if they purchased any apparel last month during the screening process. After screening, each subject was taken to a video page with random assignments from the two scenarios. Each video was between 90 s and 4 mins long. After watching the videos, subjects were requested to complete the survey on the variables: EPP, greenwashing, green confusion, GBE and brand credibility.

A total of 206 consumers voluntarily participated in the study. Although the study used non-random sampling, Jin *et al.* (2019) argued that experimental designs involving voluntary participation and random assignment are sufficient. This study followed the same experimental procedures, making it suitable for the study. Data were collected during October and November 2021. To increase the response quality and incentivize, customized gifts were distributed among randomly selected participants. Table 1 shows the summary statistics of participants' demographics.

Variable	Cases (%)	Variable	Cases (%)
Gender		*Education*	
Male	120 (58.3%)	Bachelors	108 (52.4%)
Female	86 (41.7%)	Doctoral	81 (39.3%)
		Masters	17 (8.3%)
Age		*Income*	
Less Than 20	20 (9.7%)	Less than 20,000	39 (18.9%)
20–30	108 (52.4%)	20,000–40,000	47 (22.8%)
31–40	65 (31.6%)	40, 0001–60,000	51 (24.8%)
41–50	13 (6.3%)	60,000–80,000	25 (12.1%)
		80,000 and above	44 (21.4%)

Table 1.
Demographics of the
participants

3.3 Measures

To collect all the psychometric variables, we used a five-point Likert scale. The scales used in the study were all adapted from existing literature. The scales were carefully modified and validated in the current study context. The questionnaire was prepared in the English language, as it is an official language in Pakistan (Naseer *et al.*, 2016), and most online sellers are based on the English language platform. Therefore, the researchers did not need to translate the questionnaires into the native language as the study population comprised internet users.

The greenwashing scale developed by Chen and Chang (2013b) comprised five items. Nine items adapted from Yang *et al.* (2021) were used to assess green confusion. Four items adapted from Chen (2010) were used to assess GBE. A six-item scale developed by Newell and Goldsmith (2001) was used to assess brand credibility. Finally, four items adapted from Rokka and Uusitalo (2008) were used to assess EPP. The original scale only had three items. However, based on the subject expert's recommendations, an additional reverse item was added to include the online shopping context. Table 2 summarizes the variables, corresponding items, factor loadings, reliabilities and validities.

4. Results

We used the partial least squares structural equation modeling (PLS-SEM) approach aided by the SmartPLS 3.3.3 software to examine the hypotheses set forth. Researchers prefer the PLS-SEM approach because it estimates complex models, including multiple constructs, indicator variables and structural routings, without making any assumptions about data distribution. PLS-SEM is also considered a causal-predictive approach to SEM. It emphasizes prediction in statistical model estimation (Hair *et al.*, 2021). Therefore, we performed two-stage PLS-SEM for the present study: the measurement and structural assessment models (Hair *et al.*, 2019).

4.1 Measurement model assessment

The study assessed the measurement model using multiple parameters. Hair *et al.* (2019) suggested testing internal consistency through Cronbach's alpha, convergent validity (composite reliability [CR], average variance extracted[AVE]) and discriminant validity.

Cronbach's alpha was used to test the internal consistency reliability of the measuring items, and all variables were higher than 0.70. The CR and AVE) are used to assess convergent validity. The CR scale runs from 0 to 1, with values greater than 0.70 considered acceptable (Graciola *et al.*, 2020). Because the CR values for all constructs range from 0.92 to 0.96, this is considered satisfactory. The extracted average variance should be greater than 0.5 (Hair *et al.*, 2021). The observed AVE values ranged from 0.53 to 0.76, which are considered acceptable. CR and AVE together validated the convergent validity of measures. Additionally, AVE values are greater than maximum shared squared variance (MSV), and maximum shared squared variance (ASV), showing acceptable discriminant validity (Kautish and Khare, 2022; Henseler *et al.*, 2016). Finally, following the guidelines of relevant literature (Kautish and Sharma, 2019; Kautish and Khare, 2022), Dijkstra–Henseler's ρ_A was computed to assess the construct reliabilities (Dijkstra and Henseler, 2015). Table 2 summarizes the measurement model assessment based on Cronbach alpha, CR, AVE, MSV, ASV and ρ_A.

Discriminant validity refers to the degree to which a construct in a structural model can be reliably distinguished from other constructs within the model (Hair *et al.*, 2019). The AVE of each construct should be compared to the squared inter-construct correlation of that construct and all other reflectively assessed constructs in the structural model

Excessive product packaging (EPP)	Loadings
Adapted from Rokka and Uusitalo (2008*)* $\alpha = 0.89$; $CR = 0.92$; $AVE = 0.75$; $MSV = 0.04$; $ASV = 0.02$; $\rho_A = 0.89$	
You need to spend a lot of time opening the product package	0.83
You consider the product has excessive packaging	0.87
You consider the product has lots of unnecessary packaging	0.89
Excessive product packaging is necessary to ensure product safety in the online shopping context	0.86
Greenwashing (GW)	
Adapted from Chen and Chang (2013b) $\alpha = 0.88$; $CR = 0.91$; $AVE = 0.68$; $MSV = 0.22$; $ASV = 0.10$; $\rho_A = 0.88$	
Most companies mislead with words about the environmental features of their products	0.81
Most companies mislead with visuals or graphics about the environmental features of their products	0.84
Most companies provide vague or seemingly un-provable environmental claims for their products	0.86
Most companies overstate or exaggerate the environmental features of their products	0.75
Most companies leave out or hide important information about the real environmental features of their products	0.86
Green confusion (GC)	
Adapted from Yang *et al.* (2021) $\alpha = 0.94$; $CR = 0.95$; $AVE = 0.66$; $MSV = 0.03$; $ASV = 0.01$; $\rho_A = 0.95$	
Since many apparel brands are very similar, it will be difficult to find new products	0.73
Some apparel brands look very similar, and you are not sure if they are from the same manufacturers	0.83
Sometimes you want to buy a product you see in an advertisement, but you cannot easily find it from many similar products	0.83
You are often not sure which apparel brands meet your needs	0.83
You are confused about too many apparel brands	0.81
Since there are so many ways to buy apparel brands, it is often difficult for you to decide where to buy	0.74
Apparel brands usually have so many options, making it difficult for you to compare the different products	0.83
Product features (quality and durability) are essential for you, and you often feel uncertain	0.82
You need the help of a salesperson to understand the differences between different apparel brands	0.86
Green brand equity (GBEQ)	
Adapted from Chen (2010) $\alpha = 0.87$; $CR = 0.91$; $AVE = 0.71$; $MSV = 0.22$; $ASV = 0.08$; $\rho_A = 0.88$	
It makes sense to buy a brand in the ad instead of other brands because of its environmental commitments, even if they are the same	0.88
Even if another brand has the same environmental features as the brand in the ad, you would prefer to buy this brand	0.88
If another brand's environmental performance is as good as the brand in the ad, you would prefer to buy this brand	0.77
If the environmental concern of another brand is not different from that of the brand in the ad, it seems smarter to purchase this brand	0.84
Brand credibility (BRC)	
Adapted from Newell and Goldsmith (2001*)* $\alpha = 0.93$; $CR = 0.95$; $AVE = 0.74$; $MSV = 0.13$; $ASV = 0.07$; $\rho_A = 0.94$	
This brand has a name you can trust	0.80
This brand product claims are believable	0.84
This brand delivers what it promises	0.88
This brand can deliver what it promises	0.91
Over time, my experiences with this brand had led me to expect it to keep its promises, no more and no less	0.88
This brand reminds me of someone who is competent and knows what they are doing	0.85

Notes: CR = Composite Reliability; AVE = Average Variance Extracted; MSV = maximum shared squared variance; ASV = average shared squared variance; ρ_A = Dijkstra–Henseler consistent reliability coefficient

Table 2.
Scale refinement

(Fornell and Larcker, 1981). Table 3 shows correlations and square-rooted AVEs for each construct. It can be observed that all the square-rooted AVEs were distant from the diagonal correlation values, showing satisfactory discriminant validity.

Hair *et al.* (2019) recommended using the heterotrait–monotrait (HTMT) correlation ratio to determine discriminant validity. It requires computing bootstrapping confidence intervals with 5000 resamples. The HTMT is a more reliable way to assess discrimination validity (Hair *et al.*, 2021). For conceptually comparable constructs, a threshold value of 0.90 is acceptable, whereas, for conceptually distinct constructs, a slightly lower threshold value of 0.85 is acceptable (Henseler *et al.*, 2016). While Henseler *et al.* (2015) believed that any value less than 1.00 is acceptable. All observed HTMT values are below the given limits, indicating adequate discriminant validity regardless of the case. The values in Table 3 show the test for discriminant validity based on HTMT ratios.

The variance inflation factor (VIF) is a commonly used indicator to assess the collinearity of formative indicators (VIF). The VIF scores of 5 or higher indicate serious concerns about collinearity between formatively measured construct indicators (Kautish and Sharma, 2019; Kautish and Khare, 2022). Becker *et al.* (2015) contend that collinearity issues can arise even at lower VIF values of 3. Thus, the VIF scores should ideally be three or lower. However, all observed VIFs were less than 3, indicating no collinearity issues. Therefore, the VIF was calculated in Table 3.

4.2 Structural model assessment
PLS-SEM provides the best results when formative constructs are incorporated into the structural model. The relevance of the indicator weights, indicator collinearity and statistical significance are used to evaluate formative measurement models, according to Hair *et al.* (2019).

Aside from *p*-values and alpha levels, examining the effect sizes (f^2 or f squares) (Graciola *et al.*, 2020). Hair *et al.* (2019) categorized f^2 values above 0.35 as vital and those above 0.02 as acceptable. Table 4 shows f^2 scores for each hypothesized relationship.

H1 proposed that EPP will significantly positively impact greenwashing regarding the hypothesis testing. The results show that the impact of EPP on greenwashing was significant ($t = 32.89$, $p < 0.001$), supporting *H1*. Similarly, *H2*, which proposed a significant positive impact of EPP on green confusion, was supported ($t = 2.60$, $p = 0.05$.). *H3* proposed that greenwashing has a significant negative impact on GBE. This hypothesis was also supported ($t = 4.35$, $p < 0.000$). We did not expect green confusion to negatively impact GBE ($t = 0.82$, $p > .10$). As a result, *H4* was not supported. Table 4 shows the outcome of path analysis.

Figure 2 presents the outcomes of path analysis in pictorial form.

Variable	BRC	EPP	GC	GBEQ	GW
Brand credibility (BRC)	0.86	**0.37**	**0.08**	**0.34** *(1.17)*	**0.40**
Excessive product packaging (EPP)	−0.35	0.87	**0.17** *(1.00)*	**0.48**	**0.95** *(1.00)*
Green confusion (GC)	−0.05	0.18	0.81	**0.07** *(1.07)*	**0.18**
Green brand equity (GBEQ)	0.31	−0.42	−0.05	0.84	**0.49**
Greenwashing (GW)	−0.37	0.85	0.17	−0.44 *(1.37)*	0.83

Notes: The bold values are HTMT ratios; italicized values within parathesis are VIF estimates; the rest are discriminant validity estimates

Table 3.
Discriminant validity, HTMT and VIF

Regarding moderating effects, the interaction between brand credibility and greenwashing significantly influenced GBE ($t = 2.79$, $p = 0.05$). The result supports that brand credibility moderates the negative relationship between greenwashing and GBE. When a brand's credibility is high, greenwashing is reduced. Therefore, *H5a* was supported by data analysis. Figure 3 depicts the interaction plot that shows how brand credibility interacts with greenwashing to influence GBEQ. *H5b* proposed that brand credibility moderates the negative relationship between green confusion and GBE. However, the data analysis revealed that the relationship was insignificant ($t = 1.28$, $p > 0.10$), so H5b could not be supported.

The study was built on an experimental design to determine whether excessive packaging influenced green outcomes. For this purpose, researchers used multigroup analysis using SmartPLS. *H6a* proposed that EPP would have a greater impact on GBE than minimal product packaging. Data analysis confirmed that the effect sizes were different and stronger when subjects were exposed to EPP. As a result, *H6a* was supported

Paths	Standard beta	t value	f^2	p	Decision
H1: EPP → GW	0.85	32.89	2.53	***	Supported
H2: EPP → GC	0.18	2.60	0.03	**	Supported
H3: GW → GBEQ	−0.29	4.35	0.08	***	Supported
H4: GC → GBEQ	0.06	0.82	0.01	0.410	Not supported
H5a: BRC × GW → GBEQ	0.21	2.79		**	Supported
H5b: BRC × GC → GBEQ	0.08	1.28		0.203	Not supported

Notes: $**p < 0.05$; $***p < 0.001$; BRC = Brand credibility; GC = Green confusion; GW = Greenwashing; EPP = Excessive product packaging; GBEQ = Green brand equity

Table 4.
Path coefficients

$\beta = 0.85***$

$\beta = 0.21**$

$\beta = -0.29***$

$\beta = 0.08$

$\beta = 0.18**$

$\beta = 0.06$

Greenwashing
($R^2 = 0.72$)

Brand Credibility

Green Brand
Equity
($R^2 = 0.26$)

Excessive Product
Packaging

Green Confusion
($R^2 = 0.03$)
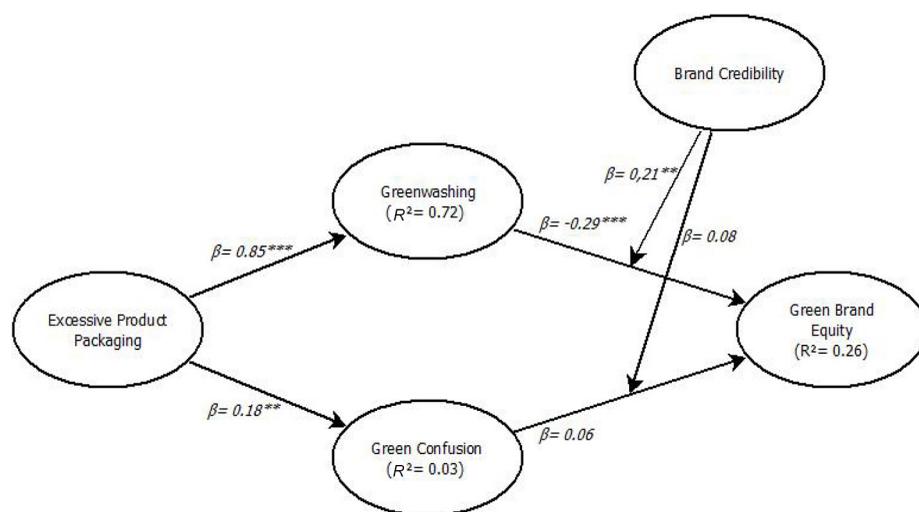
Notes: $** = p < 0.5$; $*** = p < 0.001$

Figure 2.
Structural model

Figure 3.
Plot showing
greenwashing–brand
credibility interaction
on GBE
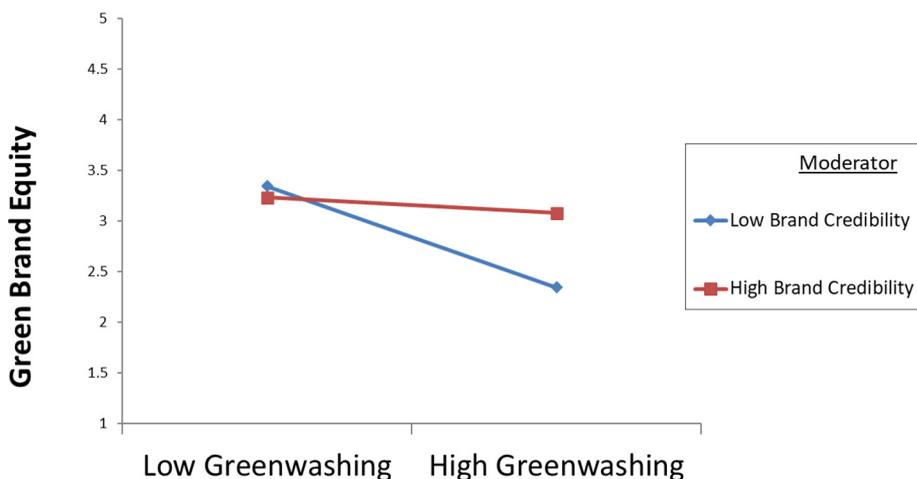
(Table 5 for details). However, *H6b* proposed that when EPP is not supported, the impact of green confusion on GBE will be higher than when minimal product packaging is supported. The data analysis revealed no differences in the outcomes, providing no support for the *H6b*.

5. Discussion and conclusion

The results showed that excessive packaging positively impacts greenwashing, corroborating the existing studies. For example, Chen *et al.* (2017) added that every huge, heavy and expensive package (more than safeguards the product) is considered excessive. Thus, EPP wastes resources and contributes to littering problems that are hazardous and costly to clean up (Wever *et al.*, 2010; Georgakoudis and Tipi, 2020). Packaging is considered the root cause of solid waste (Singh *et al.*, 2020). New environment protection approaches, notably sustainable development, call for reconsidering packaging decisions (Ingaldi and Czajkowska, 2019). Recently, consumers have blamed sellers for greenwashing (Hameed *et al.*, 2021a). Because greenwashing is attributed to insincere green efforts (Akturan, 2018), it could be linked to EPP. As the existing research posits that consumers have a negative attitude toward EPP, the greenwashing as an outcome of EPP is no surprise.

It was also found that EPP has a significant positive impact on green confusion. If companies fail to live up to their environmental claims, consumers are prone to disbelief (Waris and Hameed, 2020; Silva *et al.*, 2020). EPP by a seller which claims to be environment friendly creates an atmosphere of confusion among consumers. According

Paths	Path coefficients		*t*-value		*p*-value		Decision
	EPP	MPP	EPP	MPP	EPP	MPP	
H6a: GW → GBEQ	−0.44	−0.42	6.13	4.95	***	***	Supported
H6b: GC → GBEQ	0.24	−0.04	1.07	0.33	0.284	0.742	Not supported

Table 5.
Effects across
excessive vs minimal
packaging

Notes: ***p <0.001; EPP = Excessive product packaging; MPP = Minimal product packaging; BRC = Brand credibility; GC = Green confusion; GW = Greenwashing; GBEQ = Green brand equity

to Yang *et al.* (2021), consumers become confused when exposed to a wide range of similar green products, coupled with complex and unclear information. Consumers' information search has emotional outcomes that influence their actions (Flavián-Blanco *et al.*, 2011), where success or failure are likely to elicit positive or negative emotions. It can be argued that misleading information about green claims instills negative emotions in consumers, reduces the seller's credibility and induces confusion (Yang *et al.*, 2021; Loken *et al.*, 1986; Mitchell *et al.*, 2005). Hence, the findings support the existing knowledge in the domain.

The results support that greenwashing negatively impacts GBE. Parguel *et al.* (2011) contend that companies tend to overstate their products' environmental effectiveness through the industry's greenwash practice. The whole concept of green marketing will suffer from greenwash longer the trend continues (Hamann and Kapelus, 2004). Thus, buyers reject organizations' green marketing strategies (Chang and Chen, 2014). Additionally, consumers are more aware of environmental concerns because of rising global attention (Hameed *et al.*, 2021b, Kautish *et al.*, 2020). Invariably, consumers only want to buy green products which are environment-friendly in genuine spirit (Chang and Chen, 2014). More recently, Hameed *et al.* (2021a) found that greenwash negatively affects the brand image, loyalty, love and purchase intentions. Arguably, the negative effect of greenwashing on GBE was aligned with extant literature.

Green confusion did not affect GBE, contrary to our expectations. One plausible argument for these findings is that consumers blame where it is due. Blame theory is constructive in this regard. Cognitive theories of blame hold that blame is a judgment or evaluation that we make about an agent considering their actions, attitudes or character (Smart, 1961). For example, the seller induces greenwashing practices; thus, consumers blame the seller for their actions (Pizzetti *et al.*, 2021). However, green confusion originates from consumers' cognition and attitudes. Because of the fierce competition in the market, most products appear similar to consumers. As a result, consumers cannot distinguish between products, which leads to confusion. Therefore, these findings support the role of blame theory in green marketing.

The interaction effect of brand credibility and greenwash on GBE was significant. The results supported that the negative effect of greenwash on GBE was reduced in the presence of brand credibility. These findings also support Akturan (2018), demonstrating that brand credibility positively influences GBE. According to the theory of planned behavior (Ajzen and Fishbein, 1977), the predictive power of the attitude–behavior process favorably influences GBE. Credibility determines the amount to which buyers believe a brand's green promise (Goldsmith *et al.*, 2000). Moreover, brand credibility helps consumers determine the truthfulness of green claims (Adnan *et al.*, 2019).

Finally, consumers' reactions differed depending on what stimuli they were exposed to. The adverse effects of greenwash were escalated when exposed to EPP. Previous research classified packaging into primary, secondary and excessive forms (Elgaaïed-Gambier, 2016). Primary and secondary packaging is essential to ensure product safety and recognition. Every massive, heavy and expensive packaging is considered excessive (Chen *et al.*, 2017), wasting resources and adding to littering problems that are hazardous and expensive to clear (Wever *et al.*, 2010; Georgakoudis and Tipi, 2020). Consumers` concern for the environment has increased, so they are demanding eco-innovative and sustainable packaging solutions (Sharma *et al.*, 2022; Ingaldi and Czajkowska, 2019). Furthermore, consumers dislike excessively packaged products due to waste disposal and environmental concerns (Kautish *et al.*, 2021). Therefore, consumers prefer minimal or reduced packaging, as supported by the study's outcomes.

The present study also corroborates the findings and methodologies of previous experimental designs in green marketing literature. For example, Namkung and Jang (2013)

investigated the impact of green marketing practices on brand equity while using a scenario-based experiment. Similarly, De Vries *et al.* (2015) used a scenario-based experiment to examine the effects of communicated motives and skepticism on greenwashing perceptions. More recently, Szabo and Webster (2021) examined the effects of greenwashing on environmental and product perceptions using an experimental study. Hence, the present study adopted a similar methodology, and its results affirm the importance and relevance of experimental designs in green marketing.

5.1 Implications for theory

This study investigated the harmful green marketing practices influencing GBE. Specifically, it empirically validated that EPP and greenwashing negatively predict GBE. We argued earlier that GBE is fostered by increasing positive green branding practices while avoiding the negative ones. Given the dearth of research on the positive green branding practices (Chen, 2010; Akturan, 2018; Bekk *et al.*, 2016), this study added to GBE literature by identifying and validating the negative practices. These findings add to the growing body of knowledge in green marketing, paving the way for further research.

EPP predicted green confusion, but the effect of green confusion on GBE was not supported. Thus, more research is needed on green confusion to empirically validate its significance in green marketing literature. Additionally, EPP has different effects on GBE due to greenwashing and green confusion in different situations. However, the experimental manipulation of EPP indicates that the negative effects are more pronounced when there is EPP. These research results emphasize the significance of product packaging in green marketing literature.

Finally, green brand credibility was discovered to moderate the relationship between greenwashing and GBE. Because of the fierce competition in most industries, market offerings are often similar, confusing consumers. In these circumstances, brand credibility is crucial for distinguishing the market offering and fostering consumer trust in the seller's claims. These results reaffirm our existing knowledge of brand credibility by substantiating its vital role in the green marketing literature (Akturan, 2018), especially when consumers are skeptical.

5.2 Implications for practice

As far as practical implications are concerned, the managers must recognize the importance of GBE for the sustainability of their businesses. An unhappy and confused customer is likely to switch to a different brand, which is the last thing a seller wants. Therefore, managers must ensure that efficient product packaging practices are implemented to ensure minimalism and product safety.

Furthermore, sellers should avoid greenwashing practices to reap the benefits of green marketing strategies. Although we did not find a significant impact of green confusion on brand equity, managers must understand that confusion causes irritation and negative outcomes. Green branding strategies that distinguish one brand from others will reduce green confusion among potential customers.

As consumers find it challenging to distinguish between green brands and the growing number of brands that practice greenwashing, brand credibility is vital to building consumer trust. Brand credibility is one of the most important determinants of consumer perceptions, requiring sellers to increase brand credibility. Therefore, sellers and marketers should invest resources to develop brand credibility.

Table 6 presents the study's conclusions and theoretical and practical implications.

Conclusions	Theoretical and managerial implications
• GBE is vital for the success and sustainability of any brand promoting a green image. However, harmful green marketing practices adversely affect GBE	• Theoretically, the study informs researchers that GBE is fostered by increasing positive green branding practices while avoiding the negative ones. Regarding this, excessive product packaging, greenwashing, and green confusion are green practices adversely affecting the GBE • Conversely, brand credibility and minimal product packaging foster GBE
• Excessive product packaging, greenwashing, and green confusion are harmful green marketing practices that harm GBE	• Online marketers and sellers should ensure that minimal packaging is used. Moreover, greenwashing practices should be avoided to instill consumer trust in sellers and green marketing • Sellers having brand credibility of their green marketing enjoy consumer trust and stronger brand equity

Table 6.
Conclusions,
theoretical and
managerial
implications

5.3 Limitations and future research
Every research endeavor has some limitations, and this one is no exception. This research discovered that EPP is likely to result in two outcomes (greenwashing and green confusion). However, EPP could influence other outcomes, such as green skepticism, a possible direction for future research. We proposed brand credibility as the only boundary condition influencing the outcome of this study. Other moderating factors, such as environmental knowledge and green concerns, may also impact the results. Therefore, future studies could incorporate moderators to complement the proposed model.

We conducted an online experiment in which we manipulated the product packaging. However, the generalizability of online and lab experiments is limited, particularly in ecological generalizability. Given the limited number of field experiments in marketing, well-designed field experiments, such as in-store experiments that collect data on observable outcomes, would significantly contribute to the growth of green marketing.

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